ANACONDA MINERALS COMPANY RESPONSE TO QUESTIONS IN LETTER DATED 19 NOVEMBER 1981 FROM MARC NELSON, MINERALS MANAGEMENT SERVICE TO BILL GRAY, ANACONDA.

ANACONDA MINERALS COMPANY
NEW MEXICO OPERATIONS
RESPONSE TO MMS QUESTIONS

QUESTION

1. Characteristics of the mine:

Table of Jackpile-Paguate Mine Surface Conditions after rerouting of the Road 279 but before reclamation.

Site Designation	Area	Source	pCi 238U / g	ur/hr
C				
"				
"				
"				
"				
Sp				

(a) Site designation = the site designation conforming to Anaconda map plate 4.1-2 (Jackpile-Paguate Mine surface conditions reclamation plan).

(b) The area of each designated site including the slopes.

(c) Source = the material type, for example mixture of mine waste (shale and barren sandstone).

(d) Estimated specific activity of uranium (U-238) in each site, for example measured in a composite sample collected over each surface area.

(e) Average exposure ur/hr including the range from the highest to the lowest exposure measured over the site at a height of 3 ft. The technique previously utilized by the Anaconda staff for the measurement of average exposure is adequate.

RESPONSE

1. The following charts address items a, b, c, d, and e contained in question one. Item c (source) is described as type of material exposed on the outer surface or under the topsoil layer, where applicable, of each respective area. Item d is given as activity of Uranium-Natural in pico curies per gram.

RESPONSE 1
(Continued)

CHARACTERISTICS OF SURFACE MATERIALS
JACKPILE-PAGUATE MINE
MATERIALS CLASSIFICATION
TABLE 1

Site Designation	Area (Acres)	Type of Material on Surface or Under Topsoil
Dump A	23	Outer surface: mainly shales mixed with THS
Dump B	71	Outer surface: mainly shales mixed with THS
Dump C	21	Outer surface: THS mixed with some shales
Dump D	14	Outer surface: THS mixed with some shales
Dump E	12	Outer surface: THS mixed with some shales
Dump F	73	Under topsoil: mainly shale with some THS and JSS
Dump G	49	Under topsoil: shales and JSS
Dump H	7	Outer surface: mainly JSS and some shales
Dump I	57	Under topsoil: shales mixed with JSS
Dump J	15	Under topsoil: mainly JSS
Dump K	22	Outer surface: mainly THS mixed with some shales
Dump L	58	Under topsoil: mainly shales mixed with THS
Dump N	48	Outer surface: shales mixed with THS and JSS
Dump N2	16	Same as N
Dumps O,P,P1,P2	35	Outer surface: mainly THS with limited shales
Dump Q	52	Outer surface: JSS mixed with some shales
Dump R	14	Outer surface: shales mixed with some JSS
Dump S	96	Under topsoil: THS with some shales
Dump T	32	Under topsoil: JSS and some shales
Dump U	61	Outer surface: JSS and some shales
Dump V	51	Outer surface: JSS, shales and THS
Dump W	7	Outer surface: THS and shales
Dump X	9	Under topsoil: JSS and some shales
Dump Y	30	Outer surface: JSS and some shales and THS
Dump Y2	15	Under topsoil: JSS and some shales
South Dump	175	Outer surface: shales and THS
FD-1	168	Outer surface: shales with JSS and THS
FD-2	25	Outer surface: shales mixed with THS
FD-3	10	Outer surface: JSS and some shales and THS
17BC	15	JSS
6A	17	JSS
6B	9	JSS
J1	9	JSS
J2	8	JSS
17D	3	JSS
1B	9	JSS
2C	12	JSS
10	3	Igneous dike associated with JSS
2D	6	JSS
1C	5	JSS
1A	20	JSS

TABLE 1 (continued)

Site Designation	Area (Acres)	Type of Material on Surface or Under Topsoil
2E	3	JSS
SP-1 (PAGUATE)	9	JSS
PLG	3	JSS
4-1	8	JSS
SP-2	12	JSS
SP-2B	2	JSS
TS-1	21	THS
TS-2A	5	THS
TS-2B	6	THS
TS-3	19	THS
Borrow Site	43	THS
Jackpile Pit		
. North Pit	159	Outer surface: mixed JSS and shales
. Central Pit	158	Outer surface: mixed JSS and shales
. South Pit	158	Outer surface: mixed JSS and shales
N. Paguate Pit		
. West Pit	47	Outer surface: mixed JSS and shales
. Central Pit	47	Outer surface: mixed JSS and shales
. East Pit	46	Outer surface: mixed JSS and shales
S. Paguate Pit		
. West Pit	134	Outer surface: mixed JSS and shales
. Central Pit	133	Outer surface: mixed JSS and shales
. East Pit	133	Outer surface: mixed JSS and shales
Housing	19	Outer surface: mainly THS
Shop	17	Outer surface: mixed JSS, shales and THS
Old Shop	4	Outer surface: mixed JSS, shales and THS
P-10 Adit Area	3	Outer surface: mixed JSS, shales and THS
Pit Office Area	2	Outer surface: mixed JSS, shales and THS
Park Lot SP1	9	Outer surface: JSS mixed with shales
Park Lot SP2	12	Outer surface: JSS mixed with shales
Rail Spur (on lease area)	7	Outer surface: cinder and gravel ballast, THS and very limited JSS
Roads	88	Outer surface: mixed JSS, shales and THS

NOTES: THS--Tres Hermanos Sandstone
JSS--Jackpile Sandstone

RESPONSE 1
(Continued)

CHARACTERISTCS OF SURFACE MATERIALS AT THE
JACKPILE-PAGUATE MINE
RADIOLOGICAL ANALYSIS
TABLE 2

Site Designation	Area (Acres)	U-Nat Analysis ug/gm	U-Nat Activity pci/gm	Gamma ur/hr Average	Gamma ur/hr Range	Gamma No. of Readings
Dump A	23	4.50	3.20	10.67	7- 15	73
Dump B	71	2.70	1.90	9.73	5- 20	110
Dump C	21	2.70	1.83	5.36	4- 7	19
Dump D	14	4.05	2.74	5.33	4- 8	18
Dump E	12	1.50	1.01	5.09	4- 6	11
Dump F	73	4.03	2.73	5.37	4- 10	45
Dump G	49	5.82	3.94	5.07	4- 8	26
Dump H	7	146.80	99.38	28.74	16- 40	19
Dump I	57	10.00	7.00	5.48	3- 10	83
Dump J	15	10.66	7.22	74.50	65- 115	21
Dump K	22	20.30	13.74	6.76	4- 11	79
Dump L	58	5.50	3.72	4.66	3- 22	77
Dump N	48	42.00	30.00	9.32	7- 22	137
Dump N2	16	200.00	150.00	29.53	8- 100	78
Dump O,P,P1,P2	35	3.12	2.11	12.30	8- 17	34
Dump Q	52	160.00	120.00	68.35	7- 500	71
Dump R	14	11.00	8.00	24.27	7- 100	51
Dump S	96	2.79	1.89	10.07	8- 12	38
Dump T	32	3.90	2.80	9.10	6- 16	40
Dump U	61	34.29	23.21	51.80	16- 295	49
Dump V	51	13.94	9.44	33.63	14- 110	100
Dump W	7	2.50	1.80	9.79	6- 19	24
Dump X	9	18.00	13.00	5.19	3- 17	31
Dump Y	30	33.42	22.62	12.78	5- 30	27
Dump Y2	15	4.20	3.00	5.00	3- 8	24
South Dump	175	4.90	3.50	8.31	3- 40	119
FD-1	168	2.70	1.90	9.59	3- 65	93
FD-2	25	45.00	32.00	3.16	2- 4	19
FD-3	10	14.00	10.00	28.02	9- 70	56
17BC	15	220.00	150.00	581.42	100-1500	127
6A	17	200.00	140.00	388.37	300- 700	43
6B	9	130.00	93.00	382.73	260-1200	66
J1	9	94.00	67.00	155.32	130- 290	47
J2	8	490.00	350.00	606.30	170-1400	46
AREA 17D SHIPPED	3	520.00	370.00	198.43	24- 410	47
1B	9	140.00	100.00	237.38	60- 400	42
2C	12	110.00	79.00	422.22	300- 500	54
1O	3	390.00	280.00	505.65	120-1500	23
2D	6	180.00	130.00	419.05	80- 600	21
1C	5	61.00	44.00	227.31	160- 600	26
1A	20	31.00	22.00	161.30	130- 220	60

TABLE 2 (Continued)

Site Designation	Area (Acres)	U-Nat Analysis ug/gm	U-Nat Activity pci/gm	Gamma ur/hr Average	Gamma ur/hr Range	Gamma No. of Readings
2E	3	220.00	160.00	451.33	240-1500	30
SP-1	9	130.00	95.00	353.94	230-1200	33
PLG (OLD LOCATION)	3	5.00	3.60	210.04	34- 400	24
4-1	8	77.00	55.00	265.71	110- 460	56
SP-2	12	180.00	130.00	299.74	34-1400	70
SP-2B	2	610.00	440.00	164.24	23- 360	46
TS-1	21	4.90	3.50	7.63	3- 14	119
TS-2A	5	4.90	3.50	17.50	14- 25	26
TS-2B	6	2.90	2.10	5.70	5- 7	16
TS-3	19	3.60	2.60	11.09	9- 18	32
Topsoil Borrow Site	43	4.10	2.90	17.08	11- 40	65
Jackpile Pit						
. North	159	28.00	20.00	128.49	8-1250	114
. Central	158	180.00	130.00	107.30	18- 500	89
. South	158	760.00	540.00	165.09	18- 500	148
N. Paguate Pit						
. West	47	47.94	32.45	27.02	7- 220	184
. Central	47	53.00	38.00	113.36	30- 450	192
. East	46	85.00	61.0	78.90	30- 500	132
S. Paguate Pit						
. West	134	4.30	3.10	19.80	7- 50	163
. Central	133	17.00	13.00	28.79	12- 110	62
. East	133	24.00	17.00	71.93	18- 300	122
Housing	19	8.00	6.00	21.55	15- 30	60
Shop	17	24.00	17.00	35.69	14- 120	155
Old Shop	4	37.00	27.00	43.58	20- 80	60
P-10 Adit Area	3	120.00	86.00	192.43	35- 900	102
Pit Offices	2	31.00	22.00	44.38	30- 90	24
Park Lot at SP-1	7	56.00	40.00	77.85	30- 150	100
Park Lot at SP-2	12	32.00	23.00	102.40	70- 210	25
Rail Spur (on lease area)	7	180.00	130.00	104.42	15- 350	103
Roads	88	35.00	23.70	75.27	14-1000	485

QUESTION

2. Average U-238 specific activity of the top soil to be used for top dressing of the reclaimed sites.

RESPONSE

2. Data regarding the radioactivity in the topsoil stockpiles and the proposed topsoil borrow areas are included in Tables 1 and 2 of the response to question #1 above as TS-1, TS-2A, TS-2B, TS-3 and Borrow Site.

QUESTION

3. Average background external exposure (uR/hr) measured at 3 ft. from the ground, at four areas remote from Jackpile Mine and other exposure rate anomalies.

RESPONSE

3. Gamma exposure readings in mico r/hour, have been completed on four sites located away from mining activity and disturbance. These sites, shown on the attached map, are located on areas that do not include radioactive anomalies.

Site	Area	Average Reading	Number of Readings
1	20 acres	10.00 ur/hr	26
2	18 acres	13.20 ur/hr	15
3	20 acres	8.00 ur/hr	17
4	20 acres	9.53 ur/hr	17

Radioactive anomalies exist throughout the mine area and can have gamma exposure rates ranging from about 2 ur/hr for areas of very low gamma source material to rates on the order of 2000 ur/hr for areas of high concentration of gamma source material. An average background exposure for anomalous sites on or around the mine lease area would be meaningless without further specific definition by the Minerals Management Service.

QUESTION

4. Daily average and the hourly radon concentrations measured in air at the monitoring stations (continuous-monitoring technique).

RESPONSE

4. Daily average radon concentration data measured at the four Jackpile-Paguate Mine air monitoring stations are shown in the attached data sheets. These data represent the time period of August 1980 to the present. Hourly radon concentration data have not been developed.

QUESTION

5. Specific activity of uranium and radium in the drinking water of the neighborhood villages.

RESPONSE

5. Anaconda is unable to respond to this question because we were denied access to samples of water supplies of the Laguna communities.

QUESTION

6. Specific activity of airborne particulates measured on site (monitoring stations) and background (if available).

RESPONSE

6. The activity of airborne particulates at the four monitoring stations at the Jackpile-Paguate Mine is submitted on a quarterly basis to the MMS (USGS) Albuquerque Office. This information is also attached to this report. Activity data is available for Uranium-Natural, Lead 210, Thorium 230 and Radium 226.